International Journal of Gynecology and Obstetrics 130 (2015) E8–E14

Contents lists available at ScienceDirect

International Journal of Gynecology and Obstetrics

journal homepage: www.elsevier.com/locate/ijgo

www.figo.org

SUPPLEMENT ARTICLE

SegWeigh: A mixed-method approach to segmenting potential contraceptive user groups and meeting Family Planning 2020 goals

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ARTICLE INFO

Keywords:
Adolescents
Demographic and Health Survey
Family planning
Mixed methods
SegWeigh
Uganda
Unmet need
Vietnam

ABSTRACT

Objective: To evaluate a low-cost mixed-method research tool (SegWeigh) that informs awareness raising and family planning interventions for potential contraceptive users. *Methods:* A pilot study of SegWeigh was conducted in Uganda and Vietnam between September 3, 2012, and February 21, 2013. User archetypes were produced in four steps by triangulating Demographic and Health Survey (DHS) data; a secondary literature review; family planning service provision data; and primary qualitative investigation. *Results:* Triangulation of DHS analysis, secondary literature and service data revealed three potential user profiles: Ugandan women wanting to space pregnancies; Ugandan men wanting to limit pregnancies; and unmarried Vietnamese women having infrequent sex. Archetypes were subsequently created of "Kibuuka," a 52-year-old semi-literate subsistence farmer in rural Uganda, and "Anh," a 20-year-old student in Hanoi, Vietnam. *Conclusion:* SegWeigh rapidly produced data-rich "real life" user profiles that might help to tailor family planning interventions.

1. Introduction

In the past 50 years, there has been a large increase in the use of modern contraception in middle-income and low-income countries, with both desired and actual family sizes showing a steady decrease [1–4]. However, there remains a huge unmet need for modern family planning methods [5,6]. An estimate published in 2014 suggested that 225 million women living in low-income countries have an unmet need for contraception [7].

In recognition of this situation, the 2012 London Summit on Family Planning committed to enabling an additional 120 million women and girls in the 69 poorest countries to access and use family planning information, services, and supplies by 2020 [8]. This commitment is being taken forward by Family Planning 2020 [8].

To ensure Family Planning 2020 commitments are met, there is an essential need to tailor family planning interventions to subgroups of potential users in order to reach those with unmet need and increase overall contraceptive uptake in the world's poorest countries. Consequently, family planning programs must be devised with an understanding of the size, accessibility, and viability of underserved market segments, defined as homogeneous subgroups of potential users in a population, and with a clear picture of the characteristics of the individuals who comprise them. This goal includes in-depth knowledge of the psychosocial, behavioral, and cultural characteristics of such individuals. In this way, family planning interventions can best meet user expectations, remove barriers to access, and facilitate demand for services.

A number of tools can be used to segment family planning user markets [9,12–15]. Information traditionally used to identify potential user groups and devise appropriate programs has come from population-based surveys, including censuses; Demographic and Health Surveys (DHS); knowledge, attitude, and practice surveys; and surveys that track results continuously [9,12,13]. Although these traditional information sources can provide valuable data, they also possess important limitations. Censuses and DHS provide quantitative data, but not behavioral insights as to the 'why' and 'how' underpinning the findings. Most population-based surveys exploring knowledge, attitudes, and practices incorporate elements of psychosocial and behavioral research; however, such surveys are resource-intensive both in terms of time and money. Finally, although qualitative studies involving potential family planning user groups have been conducted in low-income countries, they did not include a prior quantitative unmet need analysis;

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http://dx.doi.org/10.1016/j.ijgo.2015.03.014

thus, their ability to help accurately identify user subgroups was limited [16–20].

To overcome these limitations, a low-cost, systematic, and reproducible method was developed to enable segmentation of potential contraceptive users with unmet need in a given country. The aim of the present study was to test this method (known as SegWeigh) in Uganda and Vietnam to characterize homogenous subgroups of potential contraceptive users with an unmet need within a broader market.

2. Materials and methods

A pilot study of SegWeigh was conducted in Uganda and Vietnam between September 3, 2012, and February 21, 2013. All study participants in the qualitative inquiry received informed consent forms and gave informed consent either verbally or in writing.

The two participating countries were selected on the basis of their differing fertility, contraceptive use, and demographics. The Ugandan DHS data were collected in 2011, whereas the data for Vietnam were collected in 2002 and did not include information on unmarried women. The SegWeigh method involved weighing the evidence from four sources, namely the DHS data; a secondary literature review; internal family planning service provision data; and a primary qualitative investigation (Fig. 1). Triangulation was conducted through group analysis in workshop settings in Kampala (Uganda) and Hanoi (Vietnam). The method involved thematic extraction and collation of evidence from data sources; cross verification to identify similar data from different sources (and thus validate the data); identification of outliers; and weighing of evidence to close information gaps.

2.1. Demographic and health survey data analysis

The DHS data were analyzed using STATcompiler (MEASURE DHS, ICF International, Calverton, MD, USA) to assess national trends in contraceptive use. Binary logistic regression was used to compare potential users with unmet need and those with no unmet need. The dependent variable was family planning use or non-use; independent variables were demographics, behavior, media use, and past exposure to messages about family planning. Binary logistic regression was conducted using SPSS version 20 (IBM, Armonk, NY, USA), with a 5% level of significance.

The present study also evaluated whether descriptive analysis of DHS data exported from SPSS to Excel (Microsoft, Redmond, WA, USA) would yield similar results to binary regression analysis and would be easier for field staff to conduct. Staff in Uganda manually highlighted differences and similarities between family planning users and non-users using data in Excel. This was not done in Vietnam, because DHS data were more than 10 years old and therefore less relevant.

2.2. Secondary literature review and analysis of internal family planning service provision

The supplementary literature review comprised peer-reviewed articles and reports not published in academic journals to further explore drivers of contraceptive use. The Scopus, PubMed, and Embase online databases were used to identify peer-reviewed articles published after 2007 relating to Uganda and Vietnam. Different combinations of the following search terms were used: 'family planning', 'contraceptives', 'contraception', 'abortion', 'fertility', 'contraception behavior', 'unmet need', 'non-users', 'barriers', 'reasons', 'culture', 'values', 'beliefs', 'psychological factors', 'locus of control', 'media', 'lifestyle', and 'humans'. An unpublished qualitative enquiry conducted by Marie Stopes Uganda into attitudes toward vasectomy and a media usage study in Uganda [21] were also consulted. For each country, approximately 20 of the most relevant articles were selected and reviewed individually. Thematic extraction of information was performed through an iterative process and this information subsequently triangulated with the DHS data during one-day group analysis workshops in Kampala (Uganda) and Hanoi (Vietnam).

Internal service provision data (service statistics and call center records) had been analyzed and profiles of current user groups had been derived. At the workshop, this information was compared with the evolving profiles of potential users with an unmet need.

Market segments were then constructed and the data sorted to identify information gaps related to demographics; behavior; service use; information sources; barriers to use; determinants of behavior; and psychographics [14].

2.3. Primary qualitative investigation

The market segments were assessed for size, accessibility, and viability by weighing estimates from at least two different sources. One

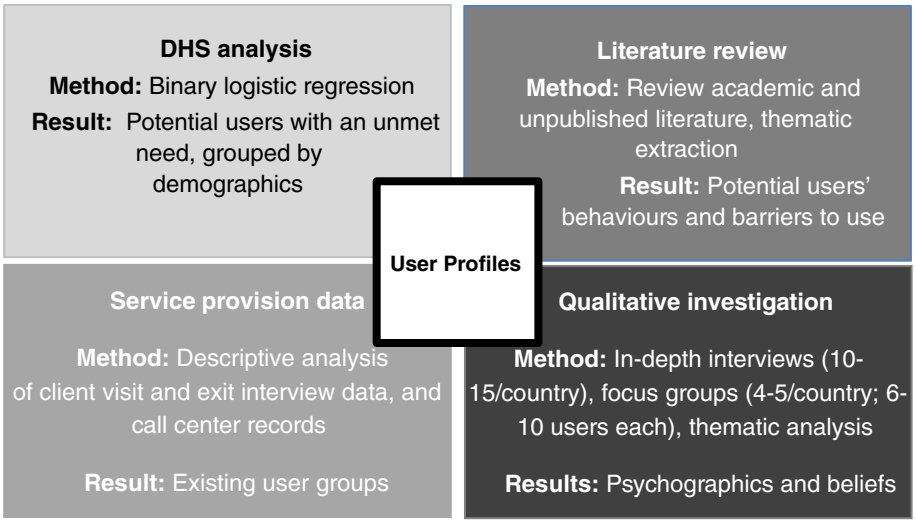

Fig. 1. The four-step process of the SegWeigh method.

market segment was prioritized per country and qualitatively investigated through both in-depth interviews (10–15 per country) and focus groups (4–5 per country; 6–10 participants in each) of potential users. Particular attention was paid to filling in the information gaps identified above.

Focus group participants were selected using purposive sampling based on the following criteria: age, sex, area where the individual lived, marital status, nationality, and proximity to family planning services. In Uganda, participants were recruited in person through visits to common areas in locations such as market places and billiards bars considered typical of those where potential users lived. In Vietnam, participants were recruited through university professors. Interviews and focus groups took place in Mukono, Mpigi, and Kabembe (Uganda) and at several locations in Hanoi (Vietnam), including the Hanoi Marie Stopes Vietnam clinic and call center and the Hanoi National University of Education.

Following the primary qualitative investigation, thematic extraction of information and triangulation with the previous data was conducted to create in-depth profiles of potential users that personified the characteristics and beliefs within the two user subgroups.

3. Results

The initial comparison of the demographic, behavioral, and media use characteristics of potential users with unmet need versus those with no unmet need using DHS data revealed profile descriptions that were not distinct enough to inform family planning programming and the lack of detail impeded prioritization of one segment over others. However, triangulation of data enabled prioritization of three segments with an unmet contraceptive need: (1) potential female users of long-acting methods in Uganda; (2) potential male users in Uganda with a need to limit pregnancies; and (3) unmarried young women in Vietnam.

3.1. Size, accessibility, and viability

Further assessment of the market segments led to prioritization of the following subgroups for primary qualitative investigation: (1) men in rural Uganda who wished to have no more children and (2) female students aged 20–24 years in Hanoi, Vietnam.

In Uganda, the market size estimate of more than four million men with an unmet need based on DHS and population data was considered sufficiently large. Anecdotally, males were known to be easily accessible through their use of mobile telephones and their tendency to have regular 'hangout' locations in public places, especially in rural areas. In Vietnam, the market size estimate of 207 629 female students in Hanoi [10,11] showed that the subgroup of students in Hanoi with sexual and reproductive health needs was also sufficiently large. Moreover, programmatic experience showed that female students were willing to pay for services and could be reached in a variety of ways, including via the internet and clinics.

3.2. Information gaps in market segment data

Most information gaps concerned psychographic parameters, such as social norms, values, beliefs, lifestyle, and ambitions. Tables 1–3 provide examples of the knowledge gained from triangulation of data from the DHS analysis, secondary literature review, and internal service provision data, as well as the information gaps and questions identified for use in the primary qualitative investigation.

3.3. Qualitative investigation and triangulation

During the qualitative investigation, motorcycle taxi drivers in Uganda were excluded as they congregate in public places but were considered unrepresentative of potential users. In Vietnam, medical students were excluded because they were considered likely to have

Table 1
Knowledge gained from data triangulation regarding select contraceptive user groups' use of media.

Category	Female students in large urban areas of Vietnam	Males with unmet need for limiting family size in rural Uganda
Media channels	Most female students know about reproductive health through the internet; however, newspapers, magazines, and television are also important information sources. The vast majority of female students visiting MSI services are referred by friends, especially those who have previously attended MSI. The internet is also an important information source for those visiting MSI.	Men are more likely than women to say they use various media and information communications technology. 84% of men say they have a radio at home. They listen to the radio for news and political programs. In addition, 44% of men say they have a mobile telephone in their household. They seldom read newspapers. They engage and are interactive with peers by keeping in touch with their daily movements. They are more likely than other user groups to receive family planning information from a health worker.
Information gaps and questions	Type of friends with whom sexual and reproductive health is being discussed	Where is his regular hangout location? With friends? During the week and at the weekend? Does he most frequently use his mobile telephone for calling or for texting?

Abbreviation: MSI, Marie Stopes International.

Table 2
Knowledge gained from data triangulation regarding select groups' barriers to using contraception.

Category	Female students in large urban areas of Vietnam	Males with unmet need for limiting family size in rural Uganda
Barriers	Female students with limited communication skills about safe sex practices are less likely to use contraceptives and to reduce their risk of sexually transmitted infections or pregnancy.	A frequent reason for not using contraception is fear of adverse effects (for their wives). According to men, the family planning methods that their wives are using— injectable contraceptives, contraceptive pills, and implants—reduce their sexual appetite. Family planning myths owing to lack of proper information. They think that vasectomy makes a man sexually weak; every second man agrees that women who use contraception become promiscuous. Only 16.4% discuss family planning with their partner.
Information gaps and questions	Other reasons for non-use still to be explored. Whether they are able to communicate well, and under what conditions, are also to be explored.	Communication with wives or partners is inadequate and required further exploration.

Table 3
Knowledge gained from data triangulation regarding select contraceptive user groups' psychographics and determinants of behavior.

Category	Female students in large urban areas of Vietnam	Males with unmet need for limiting family size in rural Uganda
Determinants of behavior and psychographics	Traditional gender roles and norms make it difficult for female students to initiate and continue discussions on contraceptive use, constraining their ability to negotiate for safe sex, use contraceptives, and take charge of their own sexuality. At the same time, female students are under pressure from notions that sexuality is an expression of modern identity, enhanced by increased knowledge of sex and changing sexual values. The general notion in Vietnam that contraception is something typically for females also affects the belief that female students are responsible for ensuring the use of contraceptives. The ability of female students to have children later in life, when they are married (as almost 100% of the students are likely to do) is of essence to them.	Does not use condom with wife (issues of distrust with wife). Uses condoms with extramarital partners to prevent HIV. Would pay for a family planning method if he was sure it had no adverse effects. "Pesters" young women by the roadside or at social functions in his spare time; some men aged 20–40 years pay girls at schooling age for casual sexual relations. Men intimidate or manipulate girls into having sex without contraceptives. Men want children from different wives. Men take contraception lightly; consider it a woman's problem. Men are concerned with political issues in society more than anything else (including family planning). Men engage and are interactive with peers.
Information gaps and questions	More insight required regarding psychographic factors such as lifestyle, needs, fears, aspirations, values, and interests. Beliefs on who should take charge of using contraceptives among unmarried couples (as the 2002 Demographic Health Survey data were based on married couples only).	More insight required into psychographic factors such as lifestyle; understanding a day in their lives; and their needs, fears, aspirations, values, and interests.

a higher level of family planning knowledge than was typical for a female student.

The life aspirations of Ugandan men were assessed during the qualitative enquiry. For example, one focus group participant aged in his mid-40s stated "I would wish to take care of my children now so they can take good care of me in my old age. This is a wish for all men. And as we get older we get tired." The analysis revealed that a caring family man in Uganda slides money across the table to his wife for her expenses in a typical gesture which is well-recognized in Uganda, and that Ugandan men admire local businessmen who earned their wealth through honest means, seeing them as role models.

The focus groups held in Vietnam highlighted that girls arriving in Hanoi for their studies were particularly vulnerable. One participant stated "In my first year, I had a friend who came from outside Hanoi. She just learned about the computer and social networks here. My girlfriend easily felt low, and easily believed the 'sweet words' of boys." New arrivals from rural areas were often targeted by city boys for 'easy' sex. A male participant shared the following: "When we send these girls an SMS [short message service] every day, it is easy to access these girls."

Triangulation of the findings from the qualitative investigation with the results of the DHS data analysis and secondary literature review produced sufficient additional information to enable the creation of in-depth profiles of typical potential users. In Uganda, 'Kibuuka' represented a 52-year-old semi-illiterate subsistence farmer (Box 1). He has good knowledge of condom use but not of vasectomy, and has psychosocial barriers to contraceptive use: "If I get a vasectomy, I will lose control over my home and will become sexually weak." In Vietnam, 20-year-old student 'Anh' is new to city life, resides on campus, and feels lonely (Box 2). She and her boyfriend have sex irregularly and without contraception. Anh knows about reproductive health services through the internet and friends.

4. Discussion

In the present study, use of SegWeigh allowed an evidence-based, data-rich understanding of market segments of potential users with an unmet contraceptive need and the creation of 'real-life' profiles of potential users that could enable highly tailored awareness raising and family planning interventions. Although use of a mixed methodology is not novel, this approach of weighing evidence has not previously been described for segmenting the family planning market. By contrast with surveys that track results continuously [13], SegWeigh can be implemented at a low cost and over a short space of time (4 weeks), which provides the opportunity to rapidly apply its results to programming. Family planning staff working in Uganda and Vietnam who used the methodology indicated a high level of acceptance and ease of use.

Academic literature on how best to segment user markets for family planning programs is lacking, which makes it difficult to compare and contrast the SegWeigh methodology directly. Analysis of DHS data alone does not allow sufficient characterization of individuals with unmet need within market segments. Indeed, this was found to be the case in the initial quantitative analysis of DHS data performed in the present study, a finding similar to a study of the family planning market in Nicaragua using DHS data [12]. Moreover, although quantitative data form a vital component of any market segmentation exercise, such information alone might be insufficient to fully reveal the drivers behind contraceptive use and non-use. Agha [22] conducted a quantitative analysis of intentions to use contraceptives in Pakistan with data from the 2007 Pakistan Social Marketing Survey on psychological correlates of family planning behavior among husbands and their non-pregnant wives. Although this study was able to identify the strongest psychological correlates, it was unable to fully determine the reasons for them. By contrast, SegWeigh uses primary qualitative investigation to determine the reasons behind the behavior of typical potential users.

A proportion of the secondary literature reviewed in the present study was quantitative in nature [23–25], but research with a qualitative component was also assessed [16–20,26–28]. Weighing the results of this secondary literature review with the DHS data and internal family planning service provision statistics allowed the identification of three broad market segments with an unmet contraceptive need in Uganda and Vietnam. However, without the subsequent collection and analysis of additional primary qualitative data, the present study would have failed to build detailed 'real life' profiles of potential users in these countries.

The present study possessed certain limitations owing to the pilot nature of the design. The sampling method and recruitment during the primary qualitative investigation was not the major focus; hence, the purposive criteria adopted could have been strengthened to recruit more data-rich cases. Moreover, purposive sampling of homogenous groups is in itself associated with limitations such as exclusion of outliers. A limited number of focus group discussions and in-depth interviews were conducted as the aim was not to reach saturation point with these methods. Nevertheless, clear recurring themes were identified and validated through focus group members reflecting on findings from the prior secondary

Box 1
Profile of a potential male contraceptive user living in Uganda who wants no more children.

Basic demographics
Name: Kibuuka
Age: 52 y (typical range, 40–60 y)
Education: semi-literate
Employment: self-employed subsistence farmer
Marital status: married (>1 wife)
Number of children: >10 (age range, 5–25 y)
Location: rural

Psychographics
He is responsible for his family economically but not emotionally
He looks forward to having put his children through school up to university level
He thinks he is past the age of dreaming and having aspirations; however, but he is inspired by successful peers in his community
He believes an ideal wife should have completed secondary school education; have a job or be self employed; be religious and from a good family; and be well behaved
He feels that his life should not stop when his wife dies or if they separate
He has the extra responsibility of taking care of his brother's and/or sister's children if these siblings pass on
He feels that he has to be in charge of the home; consequently, he believes that once he gets a vasectomy, the woman will take over
He feels he is a potential influence over the spacing of his children's births

Determinants of behavior
Does not use a condom with his wives owing to issues of distrust but does use one with extramarital partners (colloquially referred to as "side dishes") to prevent HIV
Would pay for a family planning method if he were sure it had no adverse effects
Has some level of discussion with his partner about family planning
Thinks that vasectomy makes a man sexually weak; that others might have sex with his wives; makes him impotent; causes the woman to manage the home; and causes him to have unstoppable urination

Barriers to use of family planning methods
Adverse effects of family planning methods, especially for women
Family planning methods that wives are using—such as injectable contraceptives, contraceptive pills, and implants—reduce their sexual appetite
Family planning myths caused by lack of proper information: Half of his peers agree that women who use contraception become promiscuous

Behavior
Incidence of safe sex practice decreases with age
Knowledge of male modern family planning method is very high: 92.3% of his peers know where to get a condom, although only 6.5% know about vasectomy
As he gets older, he prefers one wife (does not have the energy for more); however, he will sleep with others when he has the opportunity

Contraceptive and reproductive health service use
Relies more on periodic abstinence and withdrawal than other user groups do
Does not use a condom with his wives
Uptake of vasectomy is rare; average time until having a vasectomy after initial awareness is 2 y

Media habits and information sources
Listens to radio for news and politics
Seldom reads a newspaper
Has a regular hangout place with friends during the week and the weekend
Engages and is interactive with peers; keeps in touch and is familiar with the daily movements of his peers
Uses his mobile telephone to make calls but rarely sends text messages
Sometimes get family planning information from a health worker

data analysis and the preliminary user profiles that were emerging. Full recordings, transcripts, and translation and/or back-translation of the interviews and focus group discussions were not undertaken; consequently, detailed note-taking had to suffice for the data analysis. Furthermore, common limitations, such as the influence of the interviewer, group pressure, and courtesy bias, might have applied. The present pilot study was restricted to the generation of one user profile per country to hone the methodology. In a full SegWeigh study, multiple profiles could be constructed to describe a variety of typical potential users. SegWeigh is best suited to an investigation of unmet family planning needs that includes an initial DHS analysis. This method would, therefore, be more difficult to use in an investigation of a sexual and reproductive health area not covered by DHS (e.g. sexually transmitted infections, abortion, or cancer screening).

SegWeigh could be particularly useful in situations where DHS data are incomplete or out of date. In the present study, the data for Vietnam was collected in 2002 and lacked information from unmarried women. Nevertheless, the analysis focused on unmarried young women, as the subsequent literature review and internal service provision data indicated that there was high need among this group. Throughout the development of SegWeigh, frequent collaborative analysis was undertaken that involved both programming and marketing staff. Collaboration ensured ownership of data by programming staff, and ultimately allowed the specific drivers of demand in the target user subgroups to be pinpointed. Moreover, direct involvement of family planning staff in the field produced useful additional information as a result of their insights and experience. Further pilot studies are now warranted to help refine the SegWeigh methodology.

In Uganda, descriptive analysis by field staff of DHS data exported from SPSS to Excel spreadsheets produced results that concurred with the logistic regression analysis. This observation indicated that such an approach could be a practical way for staff not trained in the use of statistics to compare family planning user and non-user groups.

In conclusion, the present study showed that SegWeigh—a systematic and low-cost mixed methodology involving an initial quantitative unmet need analysis followed by analysis of relevant data from other sources—was able to produce detailed 'real life' potential user profiles in a short space of time. Such user profiles might enable highly targeted family planning programs to reach the underserved, which in turn could assist in working towards the commitments of Family Planning 2020.

Acknowledgments

Marie Stopes International provided funding for the development and piloting of the SegWeigh methodology.

Box 2
Profile of a potential contraceptive user who is an unmarried female student living in Hanoi, Vietnam.

Anh has come to live in Hanoi, just like approximately half of all Vietnamese female students. She is in her second year of study and is aged 20 years. Just as most of the 'ice-tea' generation (a nickname given to this specific group of students, who are known to drink a lot of ice tea), she is living in a rented room together with a female friend, as she is far away from home.

Anh has a boyfriend, just as approximately half of all the ice-tea girls do. She has had this boyfriend since her first year of study, but was too shy to tell others about him at that time. As with many girls arriving from the provinces, Anh was an easy 'target' for her boyfriend, who is in his fourth year of study. Girls arriving from the provinces are favorite 'targets', as they are considered to "easily fall in love," especially as they are quite lonely when having just arrived in Hanoi.

Anh depends on her parents for financial assistance. She has considered taking a job in addition to her studies, but she receives pressure from her parents to focus only on her studies. They regularly telephone her to remind her that she should study hard and should not have boyfriends. Anh, as most other ice-tea girls, has heard about condoms, emergency contraceptives, and the contraceptive pill. She thinks that emergency contraceptives are the best solution for her. This is because sex with her boyfriend takes place unexpectedly, and is very irregular. However, she and her boyfriend also have many questions in relation to emergency contraceptives, such as how often they can be used and their effects on fertility. The first time Anh had sex with her boyfriend, it happened unexpectedly and they did not use a condom. As sex continues to be infrequent and unplanned, she thinks that emergency contraceptives suit her really well and she is quite able to communicate about emergency contraceptives with her boyfriend. Anh has some friends in her study year and the year above her who had 'accidents' and needed to go for an induced abortion. Becoming pregnant is the fear of every ice-tea girl, but also that of their boyfriends. Anh is afraid of having to leave university and of gossip in such a situation, and her boyfriend of having to take care of the situation and bear the cost. The boyfriends of the girls who had the 'accidents' played a large part in making appointments for the induced abortions, as they also do in buying condoms and emergency contraceptives.

Access to abortion services is not a problem for Ahn; however, access to a service that she can be sure would be safe and confidential is important to her. Anh would feel very uncomfortable going to a clinic because of fear that a relative or friend would see her going. Anh does not know of any of her friends who have had a sexually transmitted infection, as such conditions are uncommon among the ice-tea generation. Anh thinks that it is quite normal for boys and girls to have sex before marriage, but that she—under influence of the traditional culture—should have remained a virgin until marriage. However, this is not what happened in reality as the boyfriend and the sex just 'happened' to her. Ahn's boyfriend also believes that having sex is normal, but his ideal woman for marriage would never have had sex.

Ahn's single friends look for boyfriends who are "good guys," meaning a boyfriend who would not ask for sex, but would be good and reliable instead. He would not use "sweet words" to get sex but would show that he respects them through his actions. However, if they happen to have sex and the girl becomes pregnant, he would be a shoulder to lean on and would support them in going to the abortion clinic. Anh, like her fellow female and male students, is very concerned about her fertility. Children are seen as a treasure for the whole family, not only for the couple. Anh and her friends, therefore, worry whether use of a contraceptive, such as the pill, will negatively affect their fertility, especially as the pill contains hormones. They also worry that they might no longer have a child because of an abortion, especially following an unsafe procedure. In her free time, Anh likes to socialize and chat with friends and make new friends on the Internet. She dresses smartly and wears makeup, as she really cares about her appearance. Anh, like her ice-tea generation friends, aspires to become a successful career woman; for example, a teacher. Aside from that, she would like to have a happy family with two children.

Conflict of interest

The authors have no conflicts of interest.

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